

Optics (Geometric and Physical) Review

⚠ This is a preview of the draft version of the quiz

Started: Nov 4 at 10:25am

Quiz Instructions

Question 1

1 pts

An EM Wave is made of a(n) _____ field and a(n) _____ field oscillating _____ to each other.

- Magnetic | Electric | Perpendicular
- Electric | Mechanical | Parallel
- Magnetic | Mechanical | Perpendicular
- Electric | Magnetic | Parallel
- Mechanical | Magnetic | Parallel

Question 2

1 pts

Wave 1 has a frequency of 2 Hz, an amplitude of 10 cm, and is at max height at time $t = 0$.

Wave 2 has a frequency of 1 Hz, an amplitude of 20 cm, and is at max height at time $t = 0$.

What is the the difference in wave heights (cm) between the two waves at time $t = 0.5$ seconds?

- 20
- 30
- 10
- 0

Question 3

1 pts

Which of the following are the same for X-rays, FM radio waves, and gamma rays traveling through air?

- The waves' wavelengths
- The waves' speeds
- The waves' frequencies
- All of the above

Question 4

1 pts

The oscillation of a transverse wave is _____ to its direction of travel, and the oscillation of a longitudinal wave is ____ to its direction of travel.

- Parallel | Perpendicular
- Perpendicular | Parallel
- Perpendicular | Perpendicular
- Parallel | Parallel

Question 5**1 pts**

What is the magnification factor of the reflection of a candle 1.5 m away from a plane mirror?

- 1.5
- 1
- 2.25
- 2.5

Question 6**1 pts**

The focal point of a concave spherical mirror is between a stone and the mirror.

The resultant stone's image _____ inverted and will be located _____ the mirror.

- will not be | in front of
- Will be | in front of
- will be | behind
- will not be | behind

Question 7**1 pts**

An object is located at the focal point of a concave mirror.

The resultant image _____.

- is inverted, the same size, and real
- does not exist
- is upright, enlarged, and virtual
- is inverted, larger, and real

Question 8**1 pts**

A pile of rocks sits 5.0 m away from a mirror. The image of the pile of rocks is real, inverted, and 2.5 m away from the mirror.

What is the magnification of the pile of rocks and what type of mirror is this?

- M = -0.5 | Convex
- M = 0.5 | Convex
- M = 0.5 | Concave
- M = - 0.5 | Concave

Question 9

1 pts

Light shines through a diamond ($n = 2.42$) sitting in a pool of water ($n = 1.33$) at an angle of 15 degrees from the normal. At what angle in degrees from the normal does light escape into the pool of water?

- 24
- 30
- 22
- 28

Question 10

1 pts

What is the critical angle in degrees for light trying to escape from a pool of water ($n = 1.33$) to air ($n = 1.000$)?

52 51 49 50**Question 11****1 pts**

A candle is located 28 cm from a lens with a focal length of 15 cm. How far in cm away from the lens should a screen be placed to find the focused image?

 34 32 30 36**Question 12****1 pts**

When tuning a guitar, or any instrument, you can play a note on the instrument and try to match it to the same note on a piano, or tone generator. If the two notes are very close in frequency, but not quite in tune with each other, it creates

something called beat patterns. These beat patterns, to an observer, sound like the note being played is wobbling or alternating between loud and soft repeatedly. Which of the following wave behaviors is responsible for beat patterns?

- interference
- polarization
- refraction
- diffraction

Question 13**1 pts**

In an experiment similar to Young's double split experiment, students are trying to determine the wavelength of a red laser light. The bright fringes are too close together for the students to measure the space in between. Which of the following can they do to increase the separation of the bright fringes?

- use a diffraction grating with fewer lines per cm
- move closer to the screen they are using
- move further away from the screen they are using
- use a diffraction grating with more lines per cm

Question 14**1 pts**

In a double slit experiment, if a filter is placed over one of the slits that only allows part of the the light to be transmitted, which of the following will happen?

- The fringe pattern will disappear and there will only be one bright band.
- The bright bands will get brighter and the dark bands will get darker.
- The bright bands won't be as bright and the dark bands won't be as dark.
- The bright bands won't be as bright and the dark bands will be darker.

Question 15

1 pts

In a Young's double slit experiment, a light source with a wavelength of 660 nm creates a fringe pattern on a screen. A second light source is shown through the same double slit and created a fringe pattern in which its third-order bright fringe overlaps with the second-order fringe of the first light. What is the wavelength in nm of the second light source?

- 640
- 440
- 940
- 540

Not saved

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